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Lynn Marcus-Wyner
Genencor International
925 Page MIll Road
Palo Alto, CA 94304-1013

EXAMINER	
MORNHINWEG, JEFFREY P	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,006	DUAN ET AL.	
	Examiner	Art Unit	
	JEFFREY MORNHINWEG	1789	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-22* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-22* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *21 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

1. Receipt of the Response and Amendment after Non-Final Office Action filed 10/04/2011 is acknowledged.

2. Claims 1-22 are pending in this action. Claims 1 and 19 have been amended. Claims 1-22 are currently under consideration. Claims 1-22 remain rejected.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. The drawings were received on 07/21/2006. These drawings are accepted.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. **Claims 1-5, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Mitchell et al. (U.S. 4,894,242).**

7. Regarding claim 1, Mitchell et al. discloses a process for producing a rice protein concentrate comprising:

enzymatically hydrolyzing a rice substrate with an enzyme having granular starch hydrolyzing (GSH) activity (specifically, glucoamylase) (C3, L44-L46; C3, L63-L65) and a second starch hydrolyzing enzyme (specifically, alpha-amylase) (C3, L40-L43) at a temperature at or below 72°C (specifically, 30°C to 100°C) (C6, L7-L11, L16) and at a pH of about 3.0 to 6.5

(specifically, a pH of from 3.5 to 7.5) (C6, L20-L22) for a period of time sufficient for the hydrolysis of a substantial portion of the starch in the rice substrate (specifically, two hours) (C8, L50, where the specification of the present application indicates an appropriate incubation time is from about 2 to 100 hours at p. 26, ll. 24-28) to obtain a solubilized starch fraction and a residue fraction which includes insoluble protein; and

separating the solubilized starch fraction from the residue to obtain a rice protein concentrate (C8, L51), wherein the rice protein is not denatured (C6, L16, where the range of from 30°C to 100°C discloses processing temperatures which are below the temperature at which proteins denature—75°C, according to the present specification at P2, L4-L14).

8. As for claim 2, Mitchell et al. discloses the enzyme having GSH activity as being a glucoamylase (C3, L44-L46; C3, L63-L64).

9. As for claim 3, Mitchell et al. discloses the glucoamylase (i.e., a glucosidase) as being derived from a strain of *Rhizopus* or *Aspergillus* (C6, L22-L26).

10. As for claim 4, Mitchell et al. discloses the second starch hydrolyzing enzyme as being an alpha-amylase (C3, L40-L43).

11. As for claim 5, Mitchell et al. discloses the alpha-amylase as being derived from a bacterial source (specifically, a strain of *Bacillus*) (C6, L11-L14).

12. As for claim 10, Mitchell et al. discloses the rice substrate as being slurried and having a dry solid content of between 10 to 55% (specifically, 25-40% dry weight rice) (C3, L40-L42).

13. As for claim 11, Mitchell et al. discloses the temperature as being between 55°C and 70°C (specifically, 30°C to 100°C) (C6, L7-L11, L16; C8, L50).

Claim Rejections - 35 USC § 103

14. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (U.S. 4,894,242) in view of Radford et al. (U.S. 5,834,191).**

15. Regarding claim 6, Mitchell et al. discloses the process according to claim 1.

16. Mitchell et al. does not disclose the enzyme having GSH activity as being obtained from the heterologous expression of a GSH enzyme in a *Trichoderma* strain or an *Aspergillus* strain.

17. However, Radford et al. discloses the use of *Aspergillus* strains for heterologous expression of hydrolytic enzymes such as glucoamylase (C1, L17-L22, L51-L54).

18. It would have been obvious to one having ordinary skill in the art to incorporate the enzyme produced in Radford et al. into the process of Mitchell et al. Radford et al. indicates glucoamylase produced by heterologous expression in *Aspergillus* is useful in industrial processes such as "the saccharification of starch" (C1, L12-L15) or "the production of glucose syrups from starch" (C1, L65-L66). Mitchell et al. discloses a process involving the saccharification of starch in rice with glucosidase to produce a rice milk (Mitchell et al., C3, L44-L46) or rice syrup (Mitchell et al., C2, L33-L47). Therefore, it would have been obvious to one having ordinary skill in the art to incorporate enzymes produced according to Radford et al. into the method disclosed in Mitchell et al.

19. **Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (U.S. 4,894,242) in view of Puski et al. (U.S. 4,830,861).**

20. Regarding claim 7, Mitchell et al. discloses the process according to claim 1.

21. Mitchell et al. does not disclose the step of purifying the rice protein concentrate.

22. However, Puski et al. discloses a step of separating rice syrup from high protein rice flour, which is effectively a purification step (C4, L18-L19).

23. It would have been obvious to one having ordinary skill in the art to incorporate the purification step disclosed in Puski et al. with the process disclosed in Mitchell et al. The process disclosed in Puski et al.—enzymatically modifying rice flour (C2, L10-L22)—is similar to that disclosed in Mitchell et al., although the two processes are primarily aimed at recovering different byproducts. The process disclosed in Puski et al. is aimed at recovering a high-protein rice flour (C3, L43-L44), while the process disclosed in Mitchell et al. is aimed at recovering a rice milk (C2, L53-L56). Since the resulting high-protein rice flour of Puski et al. has nutritional value and is useful in infant formula (Puski et al., C1, L15-L29, L36-L49; C4, L40), a skilled practitioner would recover the second by-product—the insoluble protein—from the process disclosed in Mitchell et al. in order to produce two rice products having economic value. Thus, it would have been obvious to a skilled practitioner to recover and purify the resulting insoluble protein from the process disclosed in Mitchell et al.

24. As for claim 8, Puski et al. discloses drying the rice protein concentrate (C4, L37-L39).

25. As for claim 9, Puski et al. discloses a process wherein the protein content of the rice protein concentrate is at least about 20% (specifically, 44%) (C16, L65-L67).

26. **Claims 12-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (U.S. 4,894,242) in view of Euber et al. (U.S. 4,990,344).**

27. Regarding claim 12, Mitchell et al. discloses enzymatically hydrolyzing a rice substrate with an enzyme having GSH activity (specifically, glucoamylase) (C3, L44-L46; C3, L63-L64) and a starch hydrolyzing enzyme (specifically, alpha-amylase) (C3, L40-L43) at a pH of about 3.0 to 6.5 (specifically, a pH of from 3.5 to 7.5) (C6, L20-L22) and at a temperature range of 55°C to 70°C (specifically, 30°C to 100°C) (C6, L7-L11, L16; C8, L50) to obtain a fraction

including solubilized starch and insoluble rice protein ; and separating the fractions to obtain a rice protein concentrate (C8, L51).

28. Mitchell does not disclose repeating these steps again on a rice protein concentrate in order to obtain a high-purity rice protein concentrate.

29. However, Euber et al. discloses a similar rice protein purification process (C7, L41-L57), wherein "protein levels approaching 90% to 100% can be achieved with increased water to rice ratios and wash steps" (C8, L40-L42).

30. It would have been obvious to one having ordinary skill in the art to repeat the steps disclosed in Mitchell et al. in obtaining a high-purity protein product as disclosed in Euber et al. Euber et al. indicates protein purity in rice products as high as 100% is attainable. A skilled practitioner would find obvious the repetition of the enzymatic hydrolysis to further increase a lower-purity rice protein product obtained by previous hydrolysis in order to increase the protein purity.

31. As for claim 13, Euber et al. discloses drying the high-purity rice protein concentrate (C12, L35-L36).

32. As for claim 14, Mitchell et al. discloses the starch hydrolyzing enzyme as being an alpha-amylase (C3, L40-L43).

33. As for claim 15, Euber et al. discloses protein levels approaching 90% to 100% (C8, L40-L42).

34. As for claim 16, Mitchell et al. and Euber et al. disclose rice protein concentrates obtained according to claims 1 and 12 (Mitchell et al., C8, L50-L52; Euber et al., C12, L35-L36).

35. As for claim 18, Euber et al. discloses a human food formulation comprising the rice protein concentrate obtained according to the process of claim 1 or claim 12 (C6, L29-L31).

36. **Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (U.S. 4,894,242) in view of Euber et al. (U.S. 4,990,344) as applied to claim 12 above, and further in view of Mihara et al. (U.S. 3,852,504).**

37. Regarding claim 17, Mitchell et al. and Euber et al. disclose the rice protein concentrate according to the process of claim 1 and claim 12.

38. The cited prior art does not disclose an animal feed formulation comprising the rice protein concentrate.

39. However, Mihara et al. discloses a rice protein product that is highly nutritious (C3, L10-L12), as well as a crude rice fiber product containing some protein that is "sufficiently nutritious to be used as an animal feed" (C3, L64-C4, L2).

40. It would have been obvious to one having ordinary skill in the art to incorporate the animal feed formulation disclosed in Mitchell et al. and Euber et al. into an animal feed as disclosed in Mihara et al. Mihara et al. indicates rice-bran is useful as an animal feed (C1, L12-L13). A skilled practitioner would therefore find it obvious to incorporate a high-purity rice protein product in animal feed due to it high nutritive value.

41. **Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitchell et al. (U.S. 4,894,242) in view of Puski et al. (U.S. 4,830,861), Euber et al. (U.S. 4,990,344) and Mihara et al. (U.S. 3,852,504).**

42. Regarding claim 19, Mitchell et al. discloses a process comprising:

contacting a rice substrate with a combination of enzymes which include a starch hydrolyzing enzyme (specifically, alpha-amylase) and a granular starch hydrolyzing (GSH) enzyme (specifically, glucoamylase) (C3, L40-L46; C3, L63-L64) at a temperature below 72°C (specifically, 30°C to 100°C) (C6, L7-L11, L16), wherein the rice protein is not denatured (C6, L16, where the range of from 30°C to 100°C discloses processing temperatures which are below the temperature at which proteins denature—75°C, according to the present specification at P2, L4-L14);

obtaining a solubilized starch fraction and a residue, the residue including insoluble protein (C8, L50-L52, where sieving the slurry would result in a retentate including insoluble protein);

separating the residue to obtain a rice protein concentrate (C8, L51).

43. Mitchell et al. does not disclose the duration of hydrolysis to be for a sufficient period of time to hydrolyze 60% of the starch in the rice substrate; or adding the rice protein concentrate to an animal feed.

44. However, Puski et al. indicates "[t]he length of amylase treatment is determined by the degree of starch hydrolysis required to achieve acceptable HPRF [High Protein Rice Flour] protein level" (C7, L6-L9). Euber et al. discloses a similar rice protein purification process (C7, L41-L57), wherein "protein levels approaching 90% to 100% can be achieved" (C8, L40-L42). Mihara et al. discloses a rice protein product that is highly nutritious (C3, L10-L12), as well as a crude rice fiber product containing some protein that is "sufficiently nutritious to be used as an animal feed" (C3, L64-C4, L2).

45. It would have been obvious to one having ordinary skill in the art to combine the process disclosed in Mitchell et al. with the additional conditions disclosed in Puski et al. and Euber et al. and the use of the product as disclosed in Mihara et al. Puski et al. indicates removal of carbohydrates from rice has the effect of concentrating the protein in order to create a rice product having a higher nutritional value (C1, L40-L44). Euber et al. provides higher protein concentrations than those considered in Puski et al. and would be consulted by a skilled practitioner desiring a high-purity protein rice flour. Mihara et al. indicates rice-bran is useful as an animal feed (C1, L12-L13). A skilled practitioner would therefore find it obvious to incorporate a rice protein product in animal feed due to it high nutritive value.

46. As for claim 20, Mitchell et al. discloses the starch hydrolyzing enzyme as being an alpha-amylase (C3, L40-L43).

47. As for claim 21, Mitchell et al. discloses a contacting a rice substrate with a GSH enzyme (specifically, glucoamylase) and a starch hydrolyzing enzyme (specifically, alpha-amylase) (C3, L40-L46; C3, L63-L64) enzyme to obtain a fraction including a solubilized starch and a residue comprising insoluble rice protein (C8, L50-L52, where sieving the slurry would result in a retentate including insoluble protein); and separating the residue to obtain a rice protein concentrate (C8, L51).

48. Mitchell does not disclose repeating these steps again on a rice protein concentrate in order to obtain a high-purity rice protein concentrate, or adding the high-purity rice protein concentrate to an animal feed.

49. However, Euber et al. discloses a similar rice protein purification process (C7, L41-L57), wherein "protein levels approaching 90% to 100% can be achieved with increased water to rice

ratios and wash steps" (C8, L40-L42). Mihara et al. discloses a rice protein product that is highly nutritious (C3, L10-L12), as well as a crude rice fiber product containing some protein that is "sufficiently nutritious to be used as an animal feed" (C3, L64-C4, L2).

50. It would have been obvious to one having ordinary skill in the art to repeat the steps disclosed in Mitchell et al. in obtaining a high-purity protein product as disclosed in Euber et al. Euber et al. indicates protein purity in rice products as high as 100% is attainable. A skilled practitioner would find obvious the repetition of the enzymatic hydrolysis to further increase a lower-purity rice protein product obtained by previous hydrolysis in order to increase the protein purity. Also, Mihara et al. indicates rice-bran is useful as an animal feed (C1, L12-L13). A skilled practitioner would therefore find it obvious to incorporate a rice protein product in animal feed due to it high nutritive value.

51. As for claim 22, Mihara et al. effectively discloses an animal feed comprising the high-purity rice protein concentrate obtained according to claim 21. It would have been obvious to one having ordinary skill in the art to incorporate the animal feed formulation disclosed in Mitchell et al. and Euber et al. into an animal feed as disclosed in Mihara et al. Mihara et al. indicates rice-bran is useful as an animal feed (C1, L12-L13). A skilled practitioner would therefore find it obvious to incorporate a high-purity rice protein product in animal feed due to it high nutritive value.

Response to Arguments

52. **Claim Rejections - 35 U.S.C. § 102(b) of claims 1-5, 10 and 11 over Mitchell et al.:** Applicant argued (in single-space type throughout):

> Applicants submit that "glucoamylase" and "granular starch hydrolyzing enzyme" (i.e., "raw starch hydrolyzing enzyme" and "raw starch digesting enzyme") are not interchangeable concepts. The claimed granular starch hydrolyzing enzyme "refers to an enzyme having the ability to hydrolyze starch in granular form." See Specification, lines 28-30, at page 9. However, not every glucoamylase is capable of hydrolyzing a granular starch substrate. See, e.g., U.S. Patent No. 7,262,041, paragraph bridging columns 1-2. Conversely, a GSH enzyme can be an enzyme other than a glucoamylase. A GSH enzyme can be, for example, an alpha amylase of fungal origin. See, e.g., Matsubara et al., 37 J. BIOCHEM. MOL. BIOL. 429 (2004) (enclosed as EXHIBIT I).
>
> Mitchell at best may disclose (1) hydrolyzing a rice slurry with a bacterial alpha-amylase at 80°C for 30 minutes and then at 100°C for 15 minutes; (2) cooling the slurry to 60°C; and (3) treating the slurry at 60°C with a beta-amylase and a glucoamylase for two to three hours. See Examples 1-2, columns 8-9. There is no evidence on the record, or adduced by the Office, that the glucoamylase used in Mitchell necessarily would have the granular starch hydrolyzing activity. Thus, Mitchell fails to disclose, explicitly or inherently, at least the claimed GSH enzyme.
>
> Claim 1, by reciting the properties of the resulting rice protein concentrate, is further distinguishable over Mitchell's process. Mitchell's process involves liquefying a rice slurry at 80°C for 30 minutes and then at 100°C for 15 minutes. Under Mitchell's conditions, the rice protein necessarily is denatured. See Specification, lines 4-14, at page 2 ("... rice protein is generally denatured at temperatures above 75°C...") (emphasis added).
>
> As Mitchell fails to disclose each and every claim element, claim 1 is novel. Dependent claims 2-5 are likewise novel for at least the same reasons. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

53. Applicant's arguments have been fully considered but they are not persuasive. Though "glucoamylase" and "granular starch hydrolyzing enzyme" may not be interchangeable terms, the glucoamylase disclosed in Mitchell et al. in fact does have granular starch hydrolyzing activity as evidenced by Sorimachi et al. (Sorimachi, K., Le Gal-Coeffet, M., Williamson, G., Archer., D.B., Williamson, M.P., "Solution structure of the granular starch binding domain of *Aspergillus niger* glucoamylase bound to β-cyclodextrin," *Structure*, Vol. 5, 5:647-661 (1997)). The enzyme specifically listed in Mitchell et al. as being suitable for the disclosed process—glucoamylase E.C. 3.2.1.3, or 1,4-alpha-D-Glucan glucohydrolase (C3, L64-L65)—is described in Sorimachi et al. as having granular starch hydrolyzing activity (P647, Introduction, ¶1, "The

fungal enzyme, glucoamylase 1 (G1; 1,4-α-D-glucan glucohydrolase, E.C. 3.2.1.3) from *Aspergillus niger*, hydrolyses α-D-glucosidic bonds of starch and other polysaccharides....G1 consists of two functional domains, an N-terminal catalytic domain (residues 1-470, 55kDa) and a C-terminal granular starch binding domain (SBD; residues 509-616, 12kDa)....Glucoamylases lacking SBDs have unchanged hydrolytic rates against soluble substrates, but have dramatically slower rates against granular starch."). Further, Mitchell et al. discloses the glucoamylase may be obtained from a fungal source, which includes "strains of the *Aspergillus niger* group" (C6, L22-L26). Thus, the enzyme disclosed in Mitchell et al. possesses all the limitations that are presently claimed and consequently anticipates the claimed enzyme.

54. As for the temperature, Mitchell et al. states rice is processed at a temperature of from 30°C to 100°C (C6, L7-L11, L16). The disclosed range indicates processing may occur at any temperature within that range, including temperatures below 75°C, which would prevent denaturation of the protein. The examples disclosed in Mitchell et al. wherein the processing temperature is above 75°C are merely exemplary and do not limit the reference to only those higher temperatures. Further, Mitchell et al. discloses the mixture is cooled to a temperature of from 45°C to 65°C (C6, L18), which indicates the heating temperature only need be higher than 45°C.

55. Since Mitchell et al. discloses all the claim elements, the rejection of claim 1 has been maintained herein.

56. The rejections of claims 2-5, 10 and 11, which depend from claim 1 and are rejected based on the same prior art, are additionally maintained herein.

57. **Claim Rejections - 35 U.S.C. § 103(a) of claim 6 over Mitchell et al. in view of Radford et al.:** Applicant argued:

> Mitchell at best may teach (1) hydrolyzing a rice slurry with a bacterial alpha-amylase at 80°C for 30 minutes and then at 100°C for 15 minutes; (2) cooling the slurry to 60°C; and (3) treating the slurry at 60°C with a beta-amylase and a glucoamylase for two to three hours. See Examples 1-2, columns 8-9. As discussed in Section 4 supra, "glucoamylase" and "granular starch hydrolyzing enzyme" (i.e., "raw starch hydrolyzing enzyme" and "raw starch digesting enzyme") are not interchangeable concepts, and Mitchell's process results in denaturation of the rice protein. Thus, Mitchell fails to teach at least (1) hydrolyzing a rice substrate with a GSH enzyme and (2) obtaining a rice protein concentrate having the claimed properties. Radford is relied upon for its purported teachings of expressing a modified / heterologous glucoamylase gene in filamentous fungi. See, e.g., Radford, Abstract ("The invention relates to a method and recombinant means for engineering the production of heterologous peptides in filamentous fungus."). Radford does not teach (1) hydrolyzing a rice substrate with a GSH enzyme, and (2) avoiding the denaturation of the rice protein. Thus, Radford fails to cure at least Mitchell's defects. Mitchell and Radford, alone or when viewed in combination, fail to teach or suggest all claim elements. Without all claim elements taught, there can be no expectation of success to practice the claimed methods.
>
> Given at least the above arguments, claim 6 is nonobvious over the cited references. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of claim 6.

58. Applicant's arguments have been fully considered but they are not persuasive. To the extent that Applicant's arguments repeat those addressed in relation to claim 1, the previous discussion applies likewise to the reassertion of the arguments herein. Radford et al. is adequate for what it teaches and is not relied on for teaching either the use of a granular starch hydrolyzing enzyme or avoiding the denaturation of the rice protein.

59. The rejection of claim 6 has been maintained herein.

60. **Claim Rejections - 35 U.S.C. § 103(a) of claims 7-9 over Mitchell et al. in view of Puski et al.:** Applicant argued:

> Each of claims 7-9 depends directly upon claim 1, and thus incorporates all elements from claim 1. As discussed in Sections 4 and 5.1 supra, Mitchell fails to teach at least (1) hydrolyzing a rice substrate with a GSH enzyme, and (2) obtaining a rice protein

concentrate having the claimed properties. Puski is relied upon for its purported teachings of purifying a rice protein concentrate. Puski at best may teach hydrolyzing a rice flour slurry with a heat-stable alpha amylase (Termamyl or Takalite) at 75°C to 100°C (preferably at 90°C). See Puski, column 6, lines 57-65. The heat-stable alpha amylase does not have GSH activity--Puski does not teach hydrolyzing a rice substrate with a GSH enzyme. Additionally, Puski's process (e.g., 75°C to 100°C treatment) results in the denaturation of the rice protein. Thus, Puski fails to cure at least Mitchell's defects. Mitchell and Puski, alone or when viewed in combination, fail to teach or suggest all claim elements. Without all claim elements taught, there can be no expectation of success to practice the claimed methods.

Given at least the above arguments, claims 7-9 are nonobvious over the cited references. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

61. Applicant's arguments have been fully considered but they are not persuasive. To the extent that Applicant's arguments repeat those addressed in relation to claim 1, the previous discussion applies likewise to the reassertion of the arguments herein. Puski et al. is adequate for what it teaches and is not relied on for teaching either the use of a granular starch hydrolyzing enzyme or avoiding the denaturation of the rice protein.

62. The rejections of claims 7-9 have been maintained herein.

63. **Claim Rejections - 35 U.S.C. § 103(a) of claims 12-16 and 18 over Mitchell et al. in view of Euber et al.:** Applicant argued:

Each of claims 12-16 and 18 depends directly or indirectly upon claim 1, and thus incorporates all elements from claim 1. As discussed in Sections 4 and 5.1 supra, Mitchell fails to teach at least (1) hydrolyzing a rice substrate with a GSH enzyme, and (2) obtaining a rice protein concentrate having the claimed properties. Euber is relied upon for its purported teachings of purifying a rice protein concentrate to reach a protein level of 90% to 100%. Euber at best may teach digesting a rice raw material with a thermostable alpha amylase (Termamyl or Takalite) at 90°C to 95°C for 40 minutes. See Euber, column 8, lines 7-24. The thermostable alpha amylase does not have GSH activity--Euber does not teach hydrolyzing a rice substrate with a GSH enzyme. Additionally, Euber's process (e.g., 90°C to 95°C for 40 minutes) results in the denaturation of the rice protein. Thus, Euber fails to cure at least Mitchell's defects. Mitchell and Euber, alone or when viewed in combination, fail to teach or suggest all claim elements. Without all claim elements taught, there can be no expectation of success to practice the claimed methods.

> Given at least the above arguments, claims 12-16 and 18 are nonobvious over the cited references. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

64. Applicant's arguments have been fully considered but they are not persuasive. To the extent that Applicant's arguments repeat those addressed in relation to claim 1, the previous discussion applies likewise to the reassertion of the arguments herein. Euber et al. is adequate for what it teaches and is not relied on for teaching either the use of a granular starch hydrolyzing enzyme or avoiding the denaturation of the rice protein.

65. The rejections of claims 12-16 and 18 have been maintained herein.

66. **Claim Rejections - 35 U.S.C. § 103(a) of claim 17 over Mitchell et al. in view of Euber et al. and Mihara et al.:** Applicant argued:

> Claim 17 depends directly upon claim 12, and incorporates all elements from claim 12. Mitchell and Euber fails to render claim 12 obvious for at least the reasons discussed in Section 5.3 supra. Mihara is relied upon for its purported teachings of including a rice protein product in animal feed. Mihara does not teach (1) hydrolyzing a rice substrate with a GSH enzyme, and/or (2) obtaining a rice protein concentrate having the claimed properties. Thus, Mihara fails to cure at least these defects of Mitchell and Euber. Mitchell, Euber, and Mihara, alone or when viewed in combination, fail to teach or suggest all claim elements. Without all claim elements taught, there can be no expectation of success to practice the claimed methods.
>
> Given at least the above arguments, claim 17 is nonobvious over the cited references. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of claim 17.

67. Applicant's arguments have been fully considered but they are not persuasive. To the extent that Applicant's arguments repeat those addressed in relation to claim 1, the previous discussion applies likewise to the reassertion of the arguments herein. Mihara et al. is adequate for what it teaches and is not relied on for teaching either the use of a granular starch hydrolyzing enzyme or avoiding the denaturation of the rice protein.

68. The rejection of claim 17 has been maintained herein.

69. **Claim Rejections - 35 U.S.C. § 103(a) of claims 19-22 over Mitchell et al. in view of Puski et al., Euber et al. and Mihara et al.:** Applicant argued:

> Applicants traverse the rejection to the extent it may be applied to the amended and unamended claims. The Office's rejection is unsupported, because not all claim elements are taught for at least the following reasons. Claim 19 as amended recite inter alia (1) hydrolyzing a rice substrate at the claimed temperature with a combination of (i) a starch hydrolyzing enzyme (e.g., an alpha amylase) and (ii) a granular starch hydrolyzing (GSH) enzyme; and (2) obtaining a rice concentrate having the claimed properties. Mitchell's deficiencies are discussed in Sections 4 and 5.1 supra. Mitchell at least fails to teach (1) using a combination of a starch hydrolyzing enzyme and a GSH enzyme to hydrolyze a rice substrate; and (2) obtaining a rice protein concentrate having the claimed properties. As discussed in Sections 5.2-5.4, Puski, Euber and Mihara fails to cure at least these defects of Mitchell. Thus, Mitchell, Puski, Euber and Mihara, alone or when viewed in combination, fail to teach or suggest all claim elements. Without all claim elements taught, there can be no expectation that the presently claimed methods would have worked predictably.
>
> Given at least the above arguments, claim 19 is nonobvious over the cited references. Dependent claims 20-22 are likewise nonobvious for at least the same reasons. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of the claims.

70. Applicant's arguments have been fully considered but they are not persuasive. To the extent that Applicant's arguments repeat those addressed in relation to claim 1, the previous discussion applies likewise to the reassertion of the arguments herein. Contrary to Applicant's assertion, Mitchell et al. does disclose contacting a substrate with a combination of an starch hydrolyzing enzyme and a granular starch hydrolyzing enzyme (C3, L40-L46; C3, L63-L64, where "combination" is interpreted broadly to require only the treatment of rice by the two enzymes, whether mixed in a single solution that is later added or added to the rice composition in sequence as disclosed in Mitchell et al.: "rice is heated and then liquefied, preferably by treatment with an alpha-amylase enzyme as noted above to form a liquid slurry which is treated with a glucosidase enzyme").

71. Since Mitchell et al., Puski et al., Euber et al. and Mihara et al. are considered to disclose all the claim elements, the rejections of claims 19-22 have been maintained herein.

Conclusion

72. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

73. Claims 1-22 are rejected.

74. No claims are allowed at this time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY MORNHINWEG whose telephone number is (571)270-5272. The examiner can normally be reached on Monday-Friday, 8:00AM-5:30PM, EST, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Humera Sheikh can be reached on (571) 272-0604. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Humera N. Sheikh/
Supervisory Patent Examiner, Art Unit 1789

/J. M./
Examiner, Art Unit 1789